

Application Serial No. 09/837,102  
Reply to Office Action of May 30, 2003

### Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

### Listing of Claims

- 1 (canceled)
2. (previously presented) A filter cartridge which is prepared by winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, said thermoplastic fiber being direction aligned, wherein the non-woven fabric strip satisfies the following equation (B):
$$\log_{10} Y < 3.75 - 0.75 (\log_{10} X) \quad (B)$$
wherein  $X$  ( $\text{cm}^3/\text{cm}^2/\text{sec}$ ) is an airflow amount of the non-woven fabric strip measured in accordance with JIS L 1096-A (1990), and  $Y$  ( $\text{g}/\text{m}^2$ ) is a basis weight thereof.
3. (herein amended) A filter cartridge which is prepared by winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, wherein in winding in a the twill form, a number (W) of winding the non-woven fabric strip from one end to ~~the other~~ another end in a longitudinal direction of the perforated cylinder is one to 10 per a length of 250 mm in the perforated cylinder.
4. (previously presented) The filter cartridge as claimed in claim 3, wherein when a 2-fold value (2W) of the winding number (W) is represented by a fraction having a denominator of two figures or less which is a non-reducible approximate value, the denominator is 4 to 40.

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5. (herein amended) The filter cartridge as claimed in claim ~~1~~ 2, wherein at least a part of fiber intersections of the non-woven fabric strip is thermally bonded.
6. (herein amended) The filter cartridge as claimed in claim ~~1~~ 2, wherein the non-woven fabric strip has a width of 0.5 to 40 cm.
7. (herein amended) The filter cartridge as claimed in claim ~~1~~ 2, wherein a product of a width (cm) and a basis weight (g/m<sup>2</sup>) of the non-woven fabric strip is 10 to 200.
8. (herein amended) The filter cartridge as claimed in claim ~~1~~ 2, wherein the non-woven fabric strip has a thickness of 0.02 to 1.20 mm.
9. (herein amended) The filter cartridge as claimed in claim ~~1~~ 2, wherein the non-woven fabric strip is thermal compression bonded by means of a heat embossing roll having an embossing area rate of 5 to 25%.
10. (herein amended) The filter cartridge as claimed in claim ~~1~~ 2, wherein the filter material of the filter cartridge has a void rate of 65 to 85%.
- 11 (canceled)
12. (herein amended) The filter cartridge as claimed in claim ~~11~~ 2, wherein the ~~long~~ direction aligned fiber non-woven fabric is produced by a spun bonding method.
- 13 (canceled)

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14. (herein amended) The filter cartridge as claimed in claim 1, wherein the thermoplastic fiber is a composite fiber comprising a low melting resin and a high melting resin, a difference of the melting points between these resins being 10°C or more.

15. (herein amended) The filter cartridge as claimed in claim 1, wherein the thermoplastic fiber is a fiber formed from at least one thermoplastic resin selected from the group consisting of a polyester resin, a polyamide resin, a polyethylene resin and a polypropylene resin.

16. (withdrawn) A process for producing a filter cartridge, which comprises winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, wherein the non-woven fabric strip satisfies the following equation (A):

$$\log_{10} Y < 3.75 - 0.6 (\log_{10} X) \quad (A)$$

wherein X (cm<sup>3</sup>/cm<sup>2</sup>/sec) is an airflow amount of the non-woven fabric strip measured in accordance with JIS L 1096-A (1990), and Y (g/m<sup>2</sup>), and Y (g/m<sup>2</sup>) is a basis weight thereof.

17. (withdrawn) A process for producing a filter cartridge, which comprises winding a non-woven fabric strip comprising a thermoplastic fiber around a perforated cylinder in a twill form, wherein in winding in a twill form, a number (W) of winding the non-woven fabric strip from one end to the other end in a longitudinal direction of the perforated cylinder is one to 10 per a length of 250 mm in the perforated cylinder.

18. (new) The filter cartridge as claimed in claim 2, wherein fiber intersections of said non-woven fabric strip are not resin-bonded.

19. (new) The filter cartridge as claimed in claim 3, wherein at least a part of fiber intersections of the non-woven fabric strip is thermally bonded.

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20. (new) The filter cartridge as claimed in claim 3, wherein the non-woven fabric strip has a width of 0.5 to 40 cm.
21. (new) The filter cartridge as claimed in claim 3, wherein a product of a width (cm) and a basis weight ( $\text{g/m}^2$ ) of the non-woven fabric strip is 10 to 200.
22. (new) The filter cartridge as claimed in claim 3, wherein the non-woven fabric strip has a thickness of 0.02 to 1.20 mm.
23. (new) The filter cartridge as claimed in claim 3, wherein the non-woven fabric strip is thermal compression bonded by means of a heat embossing roll having an embossing area rate of 5 to 25%.
24. (new) The filter cartridge as claimed in claim 3, wherein the filter material of the filter cartridge has a void rate of 65 to 85%.
25. (new) The filter cartridge as claimed in claim 3, wherein the direction aligned non-woven fabric is produced by a spun bonding method.
26. (new) The filter cartridge as claimed in claim 3, wherein the thermoplastic fiber is a composite fiber comprising a low melting resin and a high melting resin, a difference of the melting points between these resins being  $10^\circ\text{C}$  or more.
27. (new) The filter cartridge as claimed in claim 3, wherein the thermoplastic fiber is a fiber formed from at least one thermoplastic resin selected from the group consisting of a polyester resin, a polyamide resin, a polyethylene resin and a polypropylene resin.

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28. (new) The filter cartridge as claimed in claim 3, wherein fiber intersections of said non-woven fabric strip are not resin-bonded.